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Notes on Parasites.—Stiles.

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NOTES ON PARASITES—38-39.

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38. Preliminary Note to "A Revision of the Adult Leporine Cestodes."

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The discovery of an armed larval cestode in the intestine of rabbits, and the close relationship existing between the tape-worms of rabbits and those of man, cattle, sheep and horses, rendered it necessary to submit the leporine cestodes to an anatomical revision. This revision is now completed (ca. 50-70 pages of type and 18 plates), and will, I hope, appear before January 1, 1896, in the proceedings of the United States National Museum. Pending its appearance I take the liberty of publishing a few of my conclusions in a preliminary note.

(a) By comparing the segments of different ages in tape-worms with alternate pores, more particularly *Thysanosoma Giardi* from sheep, *Andrya americana* n. sp. from the yellow-haired porcupine and *Andrya americana leporis* n. var. from American rabbits, I conclude that the median line of some cestodes is the seat of a very active growth resulting in an increase in the breadth of the segments. This is shown by the fact that the ovary, which is at first median, is found further to the right or left of the median line respectively in each succeeding segment, while it retains approximately its same relative position to the longitudinal canals.

This obtains more strictly in *Th. Giardi* than it does in *Andrya americana*, for in the former the ovary retains a constant relation to the lateral canal, while in the latter the space between the ovary and lateral canal is considerably increased distally. Evidently no particular narrow longitudinal zone can be named as the zone of lateral growth in all cestodes, as is shown by a comparison of a large number of species. As a rule, however, the chief zone of lateral growth is the median field, and in most of the double-pored forms the chief zone lies between the ovaries. In a few double-pored forms, however, there is considerable increase in width between the ovaries and lateral canals, and in a few forms there is considerable increase in the width of the lateral field.

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(b) The armed larval cestode which I mentioned in Note 31 is not the young of an anoplocephaline tapeworm, as Curtice, Braun, and I have heretofore assumed, but represents the cysticeroid of the single-pored cestode referred to in Note 36. This parasite represents a new species of the genus *Davainea*, and I propose to name it *D. Salmoni*, dedicating it to the Chief of the Bureau of Animal Industry.

(c) The double-pored cestode with occasional single pores, described in Note 36, is *Ctenotænia variabilis* var. *angusta*.

(d) I have also found some very young stages of an unarmed cestode in the intestine of the Cotton-Tail Rabbit, which probably belong to *Ctenotænia variabilis* n. sp. This young stage corresponds to what we may expect to find as the larval form of *Moniezia expansa* of cattle and sheep, and I doubt whether it will be possible to distinguish it from the young of that species. This fact renders the question as to the origin of the tapeworms of cattle and sheep more complicated than it was formerly supposed to be, and demands the strictest experimental proof on the part of any author who suspects that he has solved the mystery of the life-history of ovine and bovine cestodes.

(e) The head of a cestode increases in size after the parasite reaches its final host, as is shown by a comparison of the younger specimens.

(f) With Blanchard I consider *Tænia wimerosa* Moniez, 1880, of rabbits an *Anoplocephala*. It is very closely related to the tapeworms of horses, and can easily be mistaken for *A. mamillana*.

(g) None of the tapeworms thus far described from European rabbits have as yet been found in America. The American forms which have been published as "*Tænia pectinata*," must be distributed over several new species which are entirely distinct from the European "*Tænia pectinata*" (= *Ctenotænia pectinata* [Goeze, 1782 partim Riehm, 1881] Railliet, 1893).

(h) Regarding Railliet's new genus *Andrya* from rabbits and its relation to Blanchard's genus *Bertia* from anthropoides, I am not in a position to express a positive opinion. I hope to examine the types while in Germany this summer, and to come to some conclusion regarding this question. In the mean time the forms which I place in *Andrya* are placed there provisionally.

(i) The following synopsis will aid in making a specific determination of all the leporine cestodes known at present. Of the forms mentioned I have studied all except *Andrya rhopalcephala* and *A. cuniculi*; the data given for these two species are based upon Riehm (1881). The form given as *Andrya americana leporis* possibly represents a good species, but my material does not warrant my raising it above varietal rank at present.

Acknowledgments for material will be made in my final paper.

Key to Adult Leporine Tapeworms.

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| 1. | { | Head armed with two rows of hooks on the rostellum and numerous hooks on the suckers; genital pores single; body rarely over 3 mm. broad Genus: <i>Davainea</i> , 2. | |
| | | Head unarmed; genital pores single or double; body nearly always more than 3 mm. broad; egg with pyriform body 3. | |

Sub-family CYSTOIDOTÆNIINÆ.

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|----|---|---|--|
| 2. | { | Suckers not invaginated; genital pores alternate; eggs grouped 3-15 in egg-capsules; strobila attains 85 mm. or more in length by 3 mm. in breadth. Hosts: Jack rabbits (<i>Lepus melanotis</i>) and the cotton-tail rabbit (<i>L. sylvaticus</i>) <i>D. Salmoni</i> n. sp. | |
| | | Suckers retractile, invaginated (always?); genital pores unilateral; eggs not grouped; strobila attains 105 mm. long by 3 mm. broad. Host: Arizona cotton-tail (<i>L. arizonæ</i>) <i>D. retractilis</i> n. sp. | |

Sub-family ANOPLOCEPHALINÆ.

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|----|---|---|--|
| 3. | { | Genital pores single, lateral; uterus transverse 4. | |
| | | Genital pores double, lateral; uterus transverse . Genus: <i>Ctenotenia</i> , 8. | |
| 4. | { | Genital pores alternate Genus: <i>Andrya</i> , 5. | |
| | | Genital pores unilateral, dextral; cirrus large, attaining ca. 0.5 mm. in length, dorsal of vagina; testicles 15-30 in each segment, left of median line, appear in 2d segment and atrophy by the 15th; ovary appears in about the median line of youngest segment and atrophies earlier than the testicles; receptaculum seminis elongate, dextral to median line; uterus ventral with proximal and distal sacs; body attains ca. 10 mm. in length by 1.5-2.5 mm. in breadth, and contains from 10 to 48 segments; proximal segments frequently asymmetrical. Host: European rabbit (<i>Lepus cuniculus</i>) and mountain hare (<i>L. variabilis</i>). It may easily be mistaken for <i>A. mamillana</i> of the horse
. <i>Anoplocephala wimerosa</i> (Moniez, 1880), R. Bl., 1893. | |

- { Body attains 60-100 cm. in length; genital pores generally unilateral for some distance and then alternate; genital organs appear in *ca.* 100th segment. European 6.
5. { Body attains 30-50 mm. in length; genital pores generally regularly alternate; genital organs appear in segments immediately back of head; testicles arranged in a band across the distal portion of the segment. American 7.
- { Genital pores near posterior corner of segment; head *ca.* 1 mm. in diameter; testicles few (*ca.* 20) in number, confined chiefly to aporous side of median field; strobila attains 60-80 cm. in length by 5 mm. in breadth. Host: Common hare (*L. timidus*) 6.
- { *Andrya rhopalcephala* (Riehm, 1881), Rail., 1893.
- { Genital pores in about the middle of the lateral margin; head *ca.* 0.5 mm. in diameter; testicles *ca.* 50 in number, scattered through entire median field; strobila attains 100 cm. in length by 8 mm. in breadth. Host: Wild rabbit (*L. cuniculus*) 6.
- { *Andrya cuniculi* (R. Bl., 1891), Rail., 1893.
- { Genital pores in posterior half of lateral margin; cirrus-pouch *ca.* 0.5 mm. long; posterior segments show a tendency to become narrow and thick; strobila attains 33 mm. in length by 0.6 mm. in breadth, and contains *ca.* 90 segments. Host: Yellow Haired Porcupine (*Erethizon epixanthus*) *Andrya americana* n. sp.
7. { Genital pores in about the middle of the lateral margin; cirrus-pouch *ca.* 0.4 mm. long; posterior segments do not become narrow; strobila attains 23-47 mm. in length by 5-6.5 mm. in breadth, and contains 60-95 segments. Host: Rabbit (*Lepus sp?*) *A. americana leporis* n. var.
- { Cirrus-pouch generally pyriform, with distinct outline, and swollen proximally by the vesicula seminalis Marmotæ-group, 9.
8. { Cirrus-pouch, tubular, resembling the nozzle of a hose, of equal or nearly equal diameter throughout its entire length and not swollen proximally to hold a prominent vesicula seminalis. Pectinata-group 12.
- { Testicles arranged in a band extending across the median field 10.
- { Testicles comparatively few in number, arranged in two groups, one corresponding to each ovary; cirrus-pouch small, 0.16 mm. long, scarcely reaching the longitudinal nerve; pore in distal part of lateral margin; female glands near ventral canal; dorsal canal dorsal or dorso-lateral of ventral canal; strobila attains 80 cm. in length by 10 mm. in breadth. Host: Rabbits (*Lepus cuniculus ferus, et domesticus*), Europe 9.
- { *Cl. Leuckarti* (Riehm, 1881), Rail., 1893.

- Testicles extend laterally of the ovaries 11.
10. { Testicles confined to distal portion of segment between the ovaries ;
cirrus-pouch *ca.* 0.5 mm. long by 0.17 mm. broad, crosses the
canals; female glands some distance from lateral canals; trans-
verse uterus single with longitudinal pouches; dorsal canal
between ventral canal and nerve; strobila may attain 112 mm.
long by 5-13 mm. broad. Hosts: Marmot (*Arctomys mar-
mota*), Europe *Ct. marmotæ* (Frölich, 1802), Rail., 1893.
11. { Cirrus-pouch very large, 1.12 mm. long by 0.32 mm. broad, female
glands not far removed from dorsal canal; several accessory
ventral canals; strobila may attain 80 cm. long by 15 mm.
broad. Hosts: Wild rabbits (*Lepus cuniculus ferus*), Europe .
. *Ct. Goezei* (Baird, 1853), Rail., 1893.
11. { Cirrus-pouch small 0.24 mm. long; female glands removed from
dorsal canal; dorsal canal lateral or dorso-lateral of ventral
canal; rec. sem. very large; segments overlapping; strobila at-
tains 40 mm. long by 5.5 mm. broad. Host: Prairie gopher
(*Geomys bursarius*), North America *Ct. pracoquus* n. sp.
12. { Cirrus-pouch *ca.* 1 mm. long, extends some distance median of
longitudinal canals; testicles arranged in a band in distal portion
of median field, extending beyond ovaries from canal to canal;
ovary some distance removed from canals; uterus single
(always?); strobila attains 40 cm. in length by 8-10 mm. broad.
Hosts: Common hare (*Lepus timidus*) and mountain hare
(*L. variabilis*), Europe . . . *Ct. pectinata* (Goeze, 1782), Rail., 1893.
12. { Cirrus-pouch not over 0.5 mm. long extends scarcely median of
lateral canals; generally two uteri, frequently one uterus. Hosts:
Lepus, North America 13.
13. { Testicles in two groups, one for each ovary, extend laterally of
ovary but absent from median field; strobila attains 57 mm. or
more in length by 10 mm. in breadth. Host: Cotton-tail rabbit
(*L. sylvaticus*) *Ct. perplexa* n. sp.
13. { Testicles in a band confined to distal portion of median field between
the ovaries; strobila attain 100-180 mm. in length by 10 mm. in
breadth. Hosts: Cotton-tail rabbit (*L. sylvaticus*) and marsh-
hare (*L. palustris*) *Ct. variabilis* n. sp. 14.
14. { Strobila nearly always more than 3 mm. broad; posterior flap of
segments nearly straight; segments slightly imbricate; genital
pore in about the middle of the lateral margin. Host: Cotton-
tail (*L. sylvaticus*) *Ct. variabilis* n. sp.
14. { Body nearly always more than 3 mm. broad; posterior flap of seg-
ments lobed; segments imbricate; genital pores generally in
distal half of lateral margin. Host: Marsh hare (*L. palustris*)
. *Ct. variabilis imbricata* n. var.
14. { Body rarely over 2 mm. broad; posterior flap straight; segments
not imbricate; genital pore generally in distal portion of lateral
margin, generally double, occasionally single. Host: Cotton-
tail Rabbit (*L. sylvaticus*) *Ct. variabilis angusta* n. var.

Types of new forms will be deposited in the Helminthological Collection, United States National Museum.

Bureau of Animal Industry, United States Department of Agriculture, July 25, 1895.

39: *Pyrosoma*, *Apiosoma* and *Piroplasma*—Generic names of the Texas-Fever Parasite.

In a recent number of the C. f. B. u. P. (Vol. XVII. p. 554-556) Wandolleck discussed the generic name which has been proposed for the parasite of Texas-fever. Upon the ground that *Pyrosoma* Smith and Kilborne, 1893, is pre-occupied by *Pyrosoma* Péron, 1804, he suppressed Smith's generic name and proposed *Apiosoma* Wandolleck, 1895, as a substitute. Unfortunately this generic term is also pre-occupied, as Blanchard applied it to a parasitic protozoon in 1885. Almost simultaneously with the appearance of Wandolleck's article (May 4th) in Germany, Patton proposed the name *Piroplasma*, Patton, 1895, (American Naturalist for May, p. 498—actual date of publication was May 13.) *Piroplasma bigeminum* (S. & K., 1893), Patton, 1895, is at present, therefore, the correct scientific name for the parasite of Texas-fever.

